

CLAIMS

1. A telecommunications system comprising :
  - a first transmitter unit situated at a first, known location;
  - a second transmitter unit situated at a second, unknown location;
  - a first receiving unit at a third, known location arranged to receive signals from the first and second transmitter units; and
  - a second receiving unit at a fourth, known location arranged to receive signals from the first and second transmitter units,wherein the said signals received by the first and second receiving units are usable to ascertain the location of the second transmitter unit.
2. A telecommunications system according to claim 1, wherein the signals are indicative of the time taken for the signals to arrive at the first and second receiving units from the first and second transmitters.
3. A telecommunications system according to claim 2, wherein the signals are used to determine the time difference between the arrival times of signals at the first and second receiving units from the first and second transmitters.
4. A telecommunications system according to any of claims 1, 2, or 3, wherein the first and/or second receiving units are moveable between a plurality of locations and are both arranged to receive a pair of signals when in each of the plurality of locations, the said pair of signals comprising a signal from the first transmitter unit and a signal from the second transmitter unit.
5. A telecommunications system according to claim 4, wherein a said pair of signals received by the first receiving unit and a said pair of signals received by the second receiving unit are together useable to calculate a range of possible locations of the second transmitter unit.

6. A telecommunications system according to claim 5, wherein the range of possible locations is in the form of a hyperbola in the X-Y plane in which the second transmitter unit is located, the said hyperbola running through substantially the location of the second transmitter unit.
7. A telecommunications system according to claim 5 or claim 6, wherein in each of the plurality of locations the first and second receiving units receive pairs of signals which differ from those pairs of signals received when the first and second receiving units are in others of the plurality of locations and the said different pairs of signals are together usable to calculate different ranges of possible locations of the second transmitter unit.
8. A telecommunications system according to claim 7, wherein the different ranges of possible locations substantially coincide at a single common location that is substantially the location of the second transmitter unit.
9. A telecommunications system according to any of claims 4 to 8, wherein, in any given location of the first and second receiving units, the pair of signals received by the first receiving unit is the same pair of signals that is received by the second receiving unit.
10. A telecommunications system according to any of claims 4 to 8, wherein in any given location of the first and second receiving units, the pair of signals received by the first receiving unit is a different pair of signals from the pair of signals received by the second receiving unit.
11. A telecommunications system according to any of claims 4 to 10, wherein the plurality of locations is three locations.
12. A telecommunications system according to any preceding claim, wherein the signals received by the first and second receiving units are received in response

to signals sent to the first and second transmitter units by the first and second receiving units.

13. A telecommunications system according to any of claims 2 to 12, wherein the said signals are further indicative of their quality or accuracy.

14. A telecommunications system according to any preceding claim, wherein the first and second receivers are separate entities.

15. A telecommunications system according to any of claims 1 to 13, wherein the first and second receivers are the same entity.

16. A telecommunications system according to claim 15, wherein the said same receiver entity is arranged to act as the said first receiver during a first period of time and as the said second receiver during a second separate period of time .

17. A telecommunications system according to any preceding claim, wherein one or both of the first and second receivers is a mobile telephone.

18. A telecommunications system according to claim 17, wherein the said mobile telephone supports Enhanced Observed Time Difference (E-OTD) location method and Global Positioning System (GPS) location method, or Observed Time Difference Of Arrival (OTDOA) location method and Global Positioning System (GPS) location method.

19. A telecommunications system according to any preceding claim, wherein one or both of the first and second transmitter units is a cellular base station.

20. A telecommunications system according to any preceding claim, wherein one or both of the first and second receivers is a location measurement unit.

21. A telecommunications system according to any preceding claim, wherein the second transmitter unit is in a fixed location.

22. A telecommunications system according to any preceding claim, further comprising a calculation unit arranged to use the signals received by the first and second receiving units or any values derived from the said signals to ascertain the location of the second transmitter unit.

23. A telecommunications system according to claim 22, as dependent on claim 13, wherein the calculation unit is arranged to take account of the indication of quality or accuracy when using the signals received by the first and second receiving units.

24. A telecommunications system according to claim 22 or claim 23, located within a telecommunications network, wherein the calculation unit is a network management unit.

25. A telecommunications system according to claim 22 or claim 23, located within a telecommunications network, wherein the calculation unit is a Serving Mobile Location Centre.

26. A telecommunications system according to any of claims 22 to 25, wherein the calculation unit is arranged to verify the accuracy of the ascertained location of the second transmitter unit by comparing it with location information of the second transmitter unit obtained from other sources.

27. A telecommunications system according to any preceding claim, wherein the ascertained location of the second transmitter unit is usable to check the accuracy of identification information of the second transmitter unit obtained from other sources and thus identify the second transmitter.

28. A telecommunications system comprising :
- a first transmitter unit situated at a first, known location;
  - a second transmitter unit situated at a second, fixed, unknown location;
  - a first receiving unit at a third, known location arranged to receive signals from the first and second transmitter units; and
  - a second receiving unit at a fourth, known location arranged to receive signals from the first and second transmitter units,
- wherein the said signals received by the first and second receiving units are usable to ascertain the location of the second transmitter unit.
29. A telecommunications system comprising :
- a first base station situated at a first, known location;
  - a second base station situated at a second, unknown location;
  - a first mobile station at a third, known location arranged to receive signals from the first and second base stations; and
  - a second mobile station at a fourth, known location arranged to receive signals from the first and second base stations,
- wherein the said signals received by the first and second mobile stations are usable to ascertain the location of the second base station.
30. A method of determining the location of a transmitter unit in a telecommunications system, the method comprising the steps of :
- receiving signals at a first receiving unit situated at a first, known location from a first transmitter unit situated at a second, known location and from a second transmitter unit situated at a third, unknown location;
  - receiving signals at a second receiving unit situated at a fourth, known location from the said first transmitter unit and from the said second transmitter unit; and
  - using the received signals to ascertain the location of the second transmitter unit.

31. A method of determining the location of a transmitter unit in a telecommunications system, the method comprising the steps of :

receiving signals at a first receiving unit situated at a first, known location from a first transmitter unit situated at a second, known location and from a second transmitter unit situated at a third, fixed, unknown location;

receiving signals at a second receiving unit situated at a fourth, known location from the said first transmitter unit and from the said second transmitter unit; and

using the received signals to ascertain the location of the second transmitter unit.

32. A method of determining the location of a base station in a telecommunications system, the method comprising the steps of :

receiving signals at a first mobile station situated at a first, known location from a first base station situated at a second, known location and from a second base station situated at a third, unknown location;

receiving signals at a second mobile station situated at a fourth, known location from the said first base station and from the said second base station; and

using the received signals to ascertain the location of the second base station.